

## Appendix G

### Landscape Plan Implementation Reference Materials

The following information from the Slope Stability Assessment report is included for reference when implementing the strategies for Objective 1, which states “Ensure no significant risk to public health, safety and resources, and tribal archaeological and cultural resources from forest management related mass-wasting events.

#### Slope Stability Sensitive Area Map

A Slope Stability Sensitive Area Map was developed for the Planning Area. It is intended to include both unstable slopes and potentially unstable slopes. The map is a composite of: 1) high and moderate slope stability hazard areas identified by the Lake Whatcom and Acme Watershed Analysis reports; 2) adjustments to portions of the high hazard slope stability map created by Watershed Analysis reports based on aerial photo interpretation, slope gradients indicated on DNR topographic map, or personal knowledge of local conditions; 3) slopes indicated to be steeper than 70% on the DNR topographic map; and 4) high slope stability hazard areas mapped as part of this Assessment in the Cain Lake basin and on the west side of Lookout Mountain.

The Slope Stability Sensitive Area Map is a compilation of the best available information regarding slope stability conditions on the Planning Area. Its level of accuracy is reasonable and sufficient for planning purposes. However, the map no doubt contains errors of inclusion and exclusion. That is, the specific locations of stable, potentially unstable, and unstable slopes are probably not represented entirely accurately on the map. For this reason, the definitions of unstable and potentially unstable slopes (as opposed to map locations) are the determining criteria for field identification.

#### Definitions of Unstable Slopes and Potentially Unstable Slopes

The attempt to distinguish between unstable slopes and potentially unstable slopes was undertaken because legislation (Engrossed Second Substitute Senate Bill 6731) directing this planning effort implies that there is a difference, and different management practices are prescribed. In fact, it is not always possible to distinguish between unstable slopes and potentially unstable slopes. (The full range of possible slope stability conditions is best envisioned as a continuum rather than a series of discrete pigeonholes.) Positive identification of potentially unstable slopes is often difficult because past slope stability conditions may not accurately foretell future conditions. Slope stability determinations are subjective processes involving the application of both “science” and professional judgment.

**Unstable slopes** exhibit evidence of recent (up to decades) persistent or sporadic mass movement. Instability may be related to, or independent of, forest management activities.

**Potentially unstable slopes** are:

- Over-steepened areas (critical gradient varies with site conditions)
- Inner gorges
- Convergent headwalls
- Bedrock hollows >70%

## Appendix G

- Toes and scarps (>65% of deep-seated landslides)
- Valley walls at outer edges of stream meanders
- Areas that exhibit a combination of “indicators” which, when considered cumulatively, indicate potential for landsliding

Potentially unstable slopes do not exhibit evidence of recent landsliding.

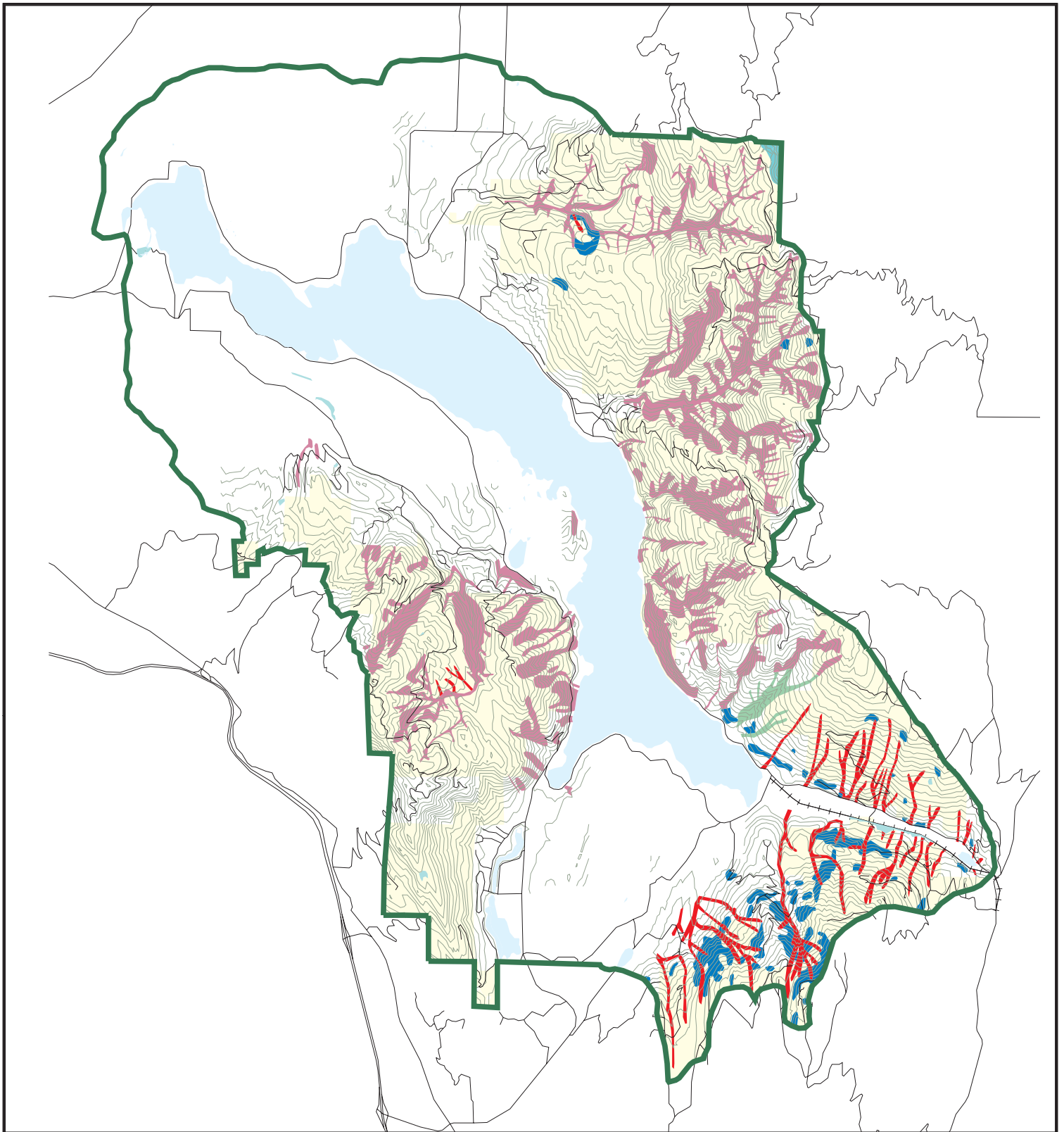
### Example “Indicators” or Landslide Potential

- New or abandoned stream channels; channels angled across slope
- Sag ponds
- Wet slopes showing springs, groundwater seepage, wet-site vegetation
- Linear, arcuate or other patterns of disturbed vegetation
- Jack-strawed, pistol-butted, tilted, or split trees
- Old landslide scars
- Very steep slopes
- Ground surface tension cracks’ small scarps (cat-steps)
- Hummocky ground
- Cracked, sagged, slumped roadways
- Debris piled against uphill side of trees
- Freshly exposed bedrock surfaces or cracks

### Application of Slope Stability Assessment Information

Proposed management activities within areas delineated on the Slope Stability Sensitive Area Map should be reviewed by a slope stability specialist. The specialist should first determine whether the proposed activity involves, or likely could affect, unstable or potentially unstable slopes. The definition of unstable and potentially unstable slopes – as opposed to map location – is the determining criteria for field identification.) If unstable or potentially unstable slopes are present, the likely effects of the proposed activity need to be specifically identified. Both site-specific slope stability-related conditions and details of the proposed activity need to be considered in determining its likely effects, and whether (or to what degree) the effects can be mitigated. These decisions should be made through an interactive process involving the slope stability specialist, the timber harvest engineer and/or road engineer, and other appropriate specialists.

The Slope Stability Sensitive Area Map and the slope stability evaluation procedures suggested in this Assessment do not supersede existing Watershed Analysis reports covering the Lake Whatcom Landscape Planning Area. Proposed management activities in the Planning Area will continue to be regulated by Forest Practices Rules and applicable Watershed Analysis Prescriptions.








# High and Moderate Hazard Mass Wasting Map Units Lake Whatcom Landscape Planning Area Final Environmental Impact Statement

Map G-1



December 08, 2003 J. Stuart

[am/thps/nw/whatcom/aml/mwmusmall.aml](http://am/thps/nw/whatcom/aml/mwmusmall.aml)

- |  |  |
|--|--|
|  MWMU 1B (ARS 1) - Moderate<br>Headscarps and toes of<br>ancient and dormant<br>deep-seated landslides  |  MWMU 4 (ARS 4) - High<br>Incised stream channels<br>and associated landforms in<br>Chuckanut Formations  |
|  MWMU 1C (ARS 2) - High<br>Incised stream channels<br>within deep-seated landslides                     | <b>Acme Watershed</b>  |
|  MWMU 2 (ARS 3) - High<br>Incised stream channels and<br>associated landforms in<br>Darrington Phyllite |  MWMU 1 (ARS MW-1)<br>- High or Moderate<br>Convergent topography greater than<br>or equal to 73%. Inner gorges,<br>bedrock hollows, channel heads. |





Map G-2

Slope Stability Sensitive Areas  
Lake Whatcom Landscape Planning Area  
Final Environmental Impact Statement



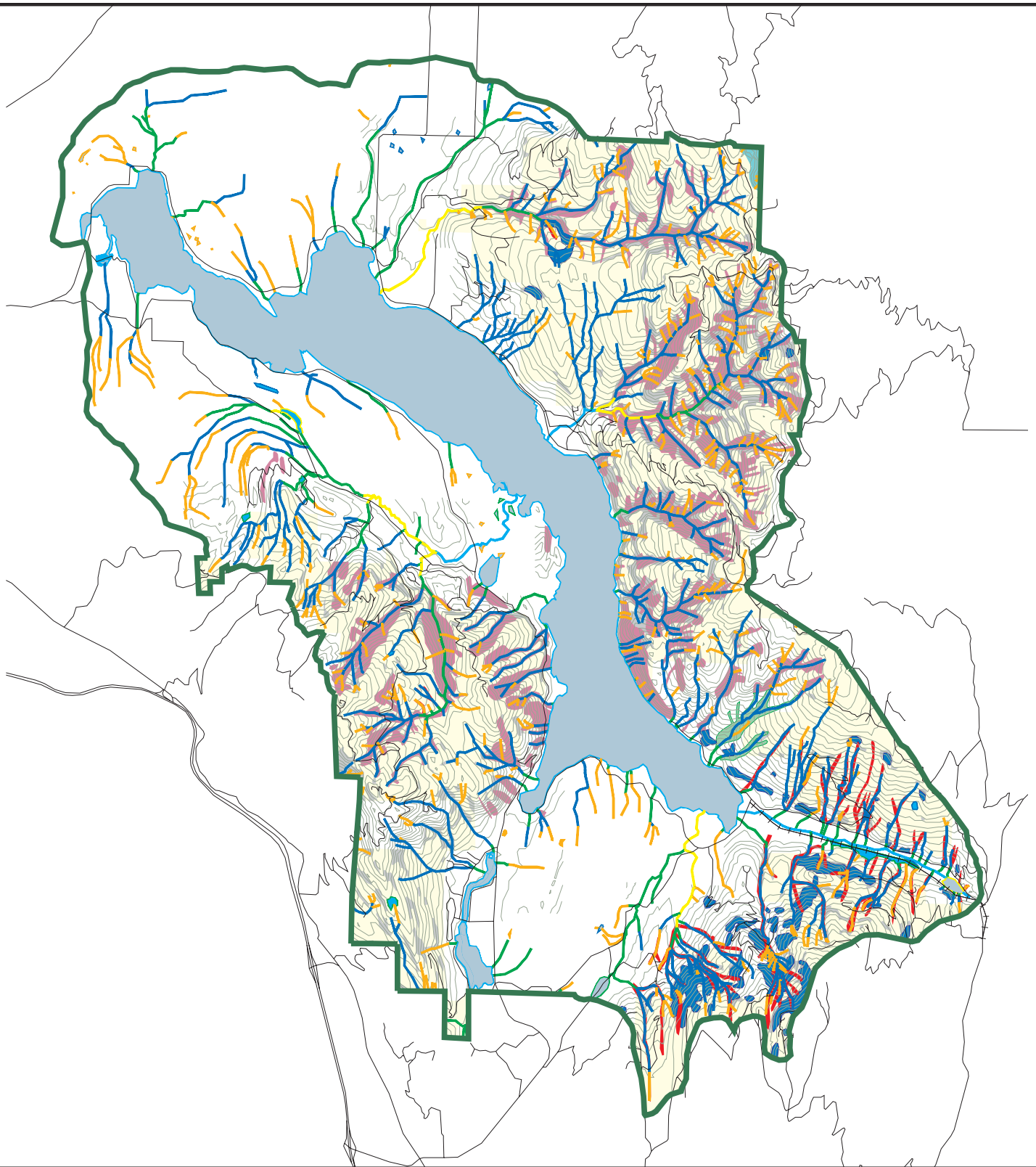
■ Potentially Unstable Slopes



December 08, 2003

[/am/thps/nw/whatcom/aml/slopesmall.aml](#)


















Map G-3

# Slope Stability and Stream Classification Lake Whatcom Landscape Planning Area Final Environmental Impact Statement

## Water Type Code

-  Type 1
-  Type 2
-  Type 3
-  Type 4
-  Type 5
-  Wetlands and Swamps
-  Ponds and Lakes

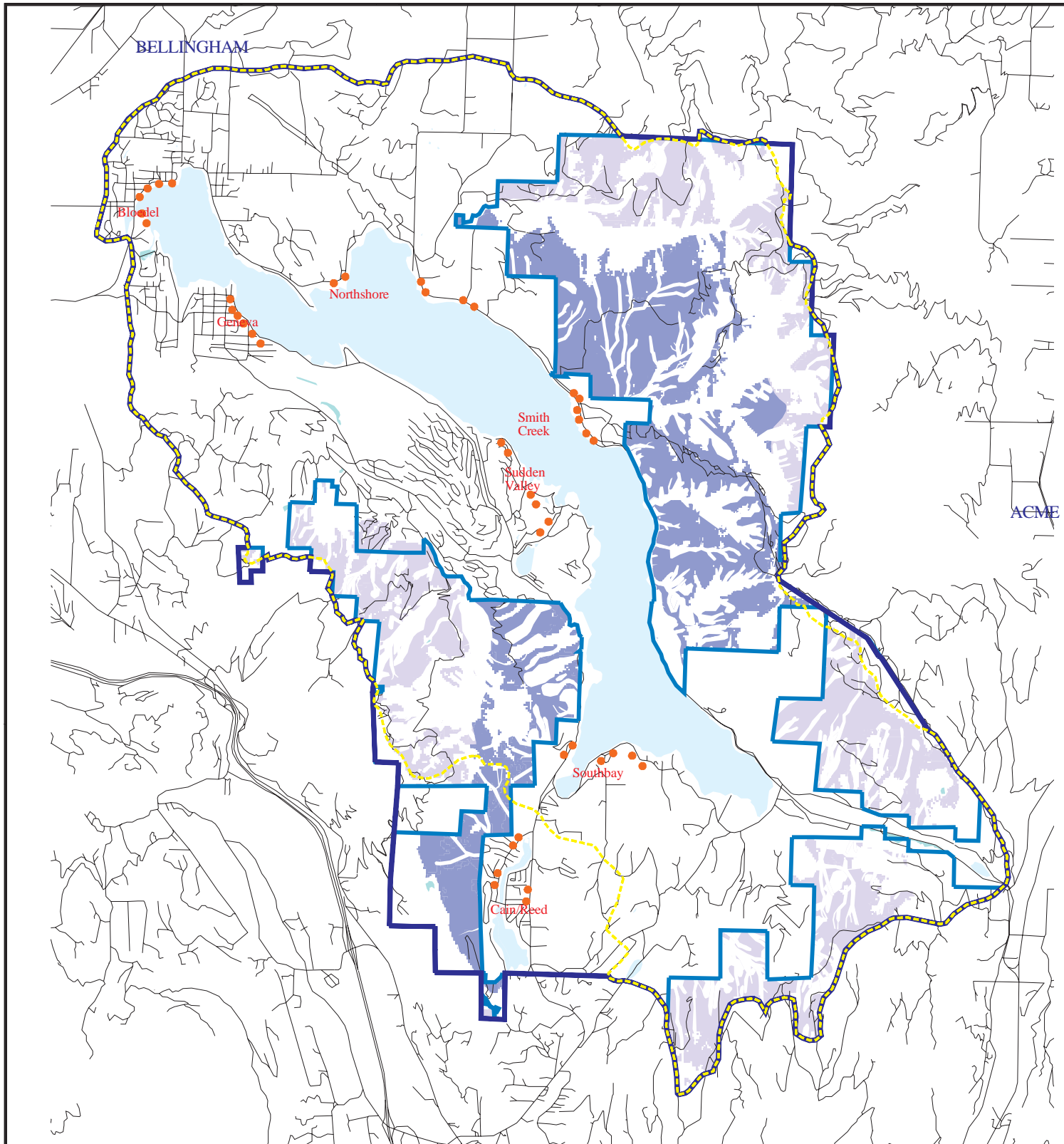
-  MWMU 1B (ARS 1) - Moderate  
Headscarp and toes of  
ancient and dormant  
deep-seated landslides
-  MWMU 1C (ARS 2) - High  
Incised stream channels  
within deep-seated landslides
-  MWMU 2 (ARS 3) - High  
Incised stream channels and  
associated landforms in  
Darrington Phyllite
-  MWMU 4 (ARS 4) - High  
Incised stream channels  
and associated landforms in  
Chuckanut Formations
-  MWMU 1 (ARS MW-1)  
- High or Moderate  
Convergent topography greater than  
or equal to 73%. Inner gorges,  
bedrock hollows, channel heads.
-  Potentially Unstable Slopes



December 09, 2003 A.Hitchcock

/am/thps/nw/whatcom/aml/slopecombo.aml











Map S-1:

### Visual Impacts Lake Whatcom Landscape Planning Area Final Environmental Impact Statement

Riparian and Unstable Areas Removed



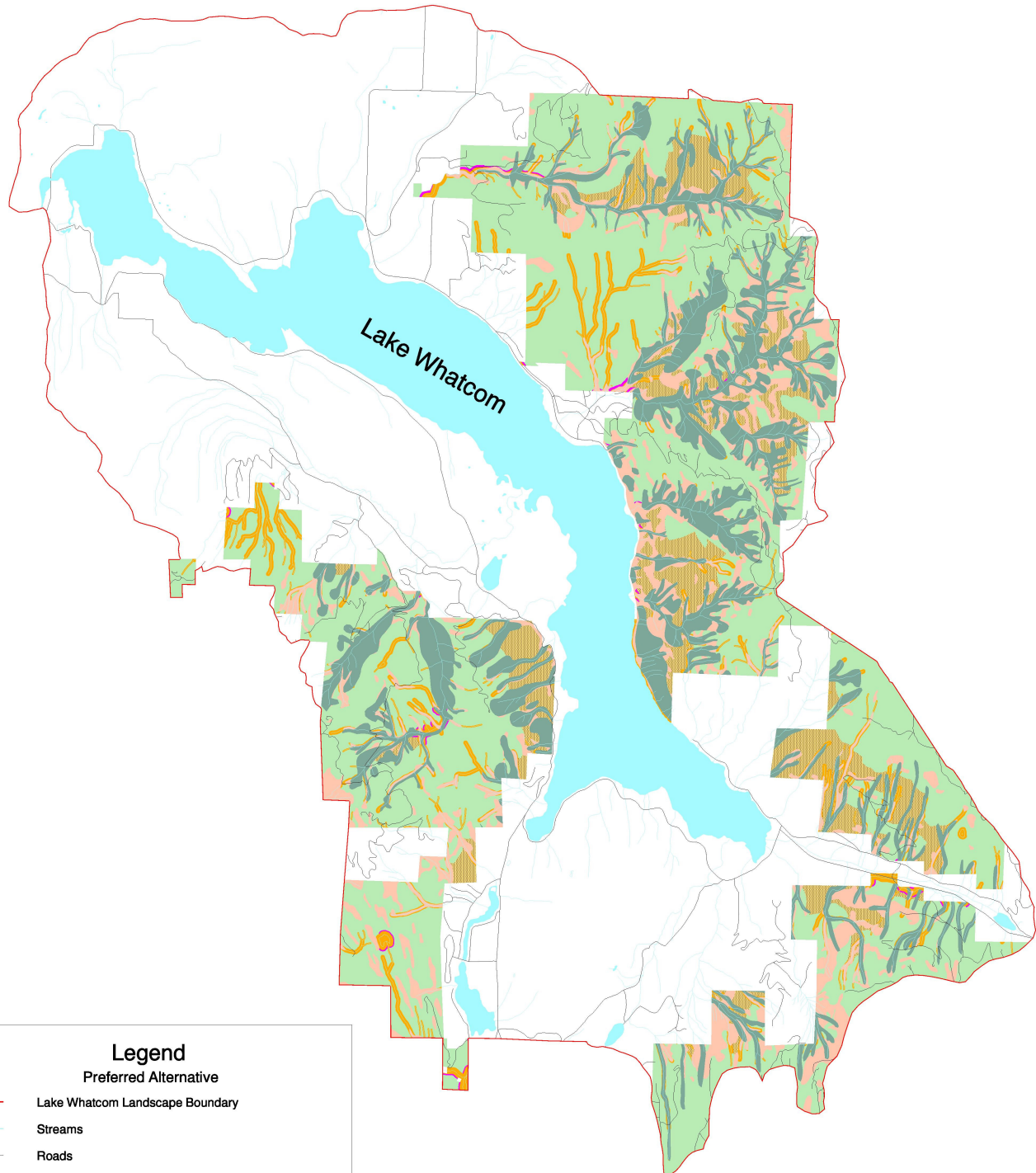
- |  |   |
|--|---|
|  Landscape Boundary |  Moderate Visibility |
|  Watershed Boundary |  High Visibility     |
|  DNR Ownership      |  Viewpoints          |



# Lake Whatcom Landscape Plan

## Final Environmental Impact Statement

### Preferred Alternative



#### Legend

##### Preferred Alternative

- Lake Whatcom Landscape Boundary
- Streams
- Roads
- Lake Whatcom
- Mass Wasting
- Potentially Unstable Slopes
- Riparian Buffer
- Wind Buffer Wind buffers shown are computer generated. In practice, they would be placed on the side of the stream with prevailing winds.
- Potentially Inaccessible Areas
- DNR Managed Forest Land

The order of this legend indicates the priority given to each map element. Areas with more restrictive management will mask other categories.

0 1 2 3 Miles



Disclaimer: Extreme care was used during the compilation of this map to ensure accuracy. However, due to changes in ownership after November, 2000, and the need to rely on outside sources of information, there are no warranties which accompany this material.

Project Location: /amv/tps/hw/whatcom/am/dels.apr



WASHINGTON STATE DEPARTMENT OF  
**Natural Resources**